



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/561,926

12/22/2005

Akira Kurozuka

2005_1641A

3215

52349

7590

03/05/2010

WENDEROTH, LIND & PONACK L.L.P.

1030 15th Street, N.W.

Suite 400 East

Washington, DC 20005-1503

EXAMINER

BIBBINS, LATANYA

ART UNIT

PAPER NUMBER

2627

NOTIFICATION DATE

DELIVERY MODE

03/05/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ddalecki@wenderoth.com

coa@wenderoth.com

DETAILED ACTION

1. In the remarks filed on October 21, 2009, Applicant amended claims 29-32, 38-40, 43-48, 50, 52, 54 and 55, cancelled claims 1-28 and 33-37, and submitted arguments for allowability of pending claims 29-32 and 38-56.

Non-Compliant Amendment (37 CFR 1.121)

2. The amendment document filed on October 21, 2009 is considered non-compliant because it has failed to meet the requirements of 37 CFR 1.121 or 1.4. In order for the amendment document to be compliant, correction of the following item(s) is required:

The following item caused the amendment document to be non-compliant:

- a. Amendments to the claims:
 - i. Each claim has not been provided with the proper status identifier, and as such, the individual status of each claim cannot be identified.

Note: the status of every claim must be indicated after its claim number by using one of the following status identifiers: (Original), (Currently amended), (Canceled), (Previously presented), (New), (Not entered), (Withdrawn) and (Withdrawn-currently amended). In this instance, the status identifiers for claims 41, 42, 49, 51, 53 and 56 are "original" however the claims were not present in the application as filed and as such are not original claims. Claims 41, 42, 49, 51, 53 and 56 should be provided with the "previously presented" status identifier.

Response to Arguments

3. Applicant's arguments filed October 21, 2009 have been fully considered but they are not persuasive.

Applicant argues that Maruyama does not disclose that the permanent magnet is magnetized or demagnetized, therefore "according to the reference" it is necessary to apply a constant electric current to the coil to maintain the electromagnetic force need to change the form of the variable mirror. With respect to the deformable mirror recited in the claims Applicant argues that a switching signal needs only to be applied at the time of switching between the magnetized state and the demagnetized state of the hard magnet member, therefore constant electric current is not needed to maintain a magnetic force used to control the reflection mirror.

With regard to Applicants argument that Maruyama does not disclose that the permanent magnet is magnetized or demagnetized and therefore it is necessary to apply a constant electric current to the coil to maintain the electromagnetic force need to change the form of the variable mirror, Examiner respectfully disagrees.

By definition, a permanent magnet retains magnetism after being magnetized by electrical current. Maruyama discloses a deformable mirror able to change to flat, convex and concave surfaces (see the discussion in paragraph [0017]). In paragraphs [0036], [0037] and [0039] Maruyama further discloses applying "switchable current" and "current of different quantities" to the coils in order to deform the mirror to the desired shape. Maruyama also teaches that the direction of the current can be changed to

Art Unit: 2627

achieve the desired surface. Since the permanent magnet retains magnetism after being magnetized by electrical current, in order for the mirror to change to either flat, convex, or concave after application of an electrical current, the permanent magnet must be demagnetized.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., that a switching signal needs only to be applied at the time of switching between the magnetized state and the demagnetized state of the hard magnet member) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 29-32, 39, 40, 45 and 52-55 are rejected under 35 U.S.C. 102(b) as being anticipated by Maruyama (JP 2003-067969).**

Regarding claim 29, a deformable mirror (element 409 of drawings 16 and 18) comprising: a reflection mirror having a reflection surface on which light is reflected (409a of drawings 16 and 18 and the discussion in paragraphs [0036]-[0039]), at least

Art Unit: 2627

part of the reflection mirror being made of a ferromagnetic member (409e of drawings 16 and 18 and the discussion in paragraphs [0036]- [0039]), the reflection mirror having a deformed state and a non-deformed state (see the discussion in paragraphs [0017] and [0036]-[0038] where current of different values are applied to the coils to achieve different deformations of the mirror); and a switching device that switches the reflection mirror between the deformed state and the non-deformed state using a magnetic force (elements 428 and 413 of drawings 16 and 18 respectively and the discussion in paragraphs [0036]-[0039]), the switching device having a hard magnetic member made of a hard magnetic material and a magnetizing unit (elements 426 and 427 of drawings 16 and 18 and the discussion in paragraphs [0036]- [0039]), wherein the hard magnetic member has a state in which the hard magnetic member is magnetized and a state in which the hard magnetic member is demagnetized, and the magnetizing unit is switchable between the state in which the hard magnetic member is magnetized and the state in which the hard magnetic member is demagnetized (see the discussion in paragraphs [0036]-[0038] where current of different values are applied to the coils to achieve different deformations of the mirror).

Regarding claim 30, Maruyama discloses the deformable mirror according to claim 29, wherein: the reflection mirror is switched into the deformed state by attracting the ferromagnetic member in the reflection mirror when the hard magnetic member is magnetized by the magnetizing unit, and the reflection mirror is switched into-the non-deformed state when the hard magnetic member is demagnetized by the magnetizing unit (see the discussion in paragraphs [0017] and [0036]- [0039]).

Regarding claim 31, Maruyama discloses the deformable mirror according to claim 29, wherein: the magnetizing unit includes a yoke, a magnetizing coil, and a sub-coil (see elements 423, 426 and 427 of drawings 16 and 18 and drawings 19-21).

Regarding claim 32, Maruyama discloses the deformable mirror according to claim 31, wherein: the reflection mirror includes a back surface (see drawings 16-21) and a side portion and at least part of the sub-coil and the yoke are disposed on the back surface and the side portion of the reflection mirror (see drawings 16-21).

Regarding claim 39, Maruyama discloses the deformable mirror according to claim 29, wherein: the reflection mirror includes a base member comprising a ferromagnetic plate material (409e of drawings 16 and 18 and the discussion in paragraph [0039]).

Regarding claim 40, Maruyama discloses the deformable mirror according to claim 31, wherein: the ferromagnetic member and the yoke form part of a magnetic circuit (see drawings 16-21).

Regarding claim 45, Maruyama discloses the deformable mirror according to claim 29, wherein: the ferromagnetic member is made of a hard magnetic material (see the discussion in paragraph [0039]).

Regarding claim 52, Maruyama discloses an optical head configured to concentrate light on an optical information recording medium (drawings 6 and 7), the optical head comprising: an objective lens that concentrates light on the optical information recording medium (element 7 of drawings 6 and 7); an objective lens actuator that drives the objective lens (see the discussion in paragraphs [0002]-[0006]);

Art Unit: 2627

and the deformable mirror disposed to reflect light emitted from a light source toward the objective lens (element 6 of drawings 6 and 7), a deformable mirror including: a reflection mirror having a reflection surface on which light is reflected (409a of drawings 16 and 18 and the discussion in paragraphs [0036]-[0039]), at least part of the reflection mirror being made of a ferromagnetic member (409e of drawings 16 and 18 and the discussion in paragraphs [0036]- [0039]), the reflection mirror having a deformed state and a non-deformed state (see the discussion in paragraphs [0017] and [0036]-[0038] where current of different values are applied to the coils to achieve different deformations of the mirror); and a switching device that switches the reflection mirror between the deformed state and the non-deformed state using a magnetic force (elements 428 and 413 of drawings 16 and 18 respectively and the discussion in paragraphs [0036]-[0039]), the switching device having a hard magnetic member made of a hard magnetic material and a magnetizing unit (elements 426 and 427 of drawings 16 and 18 and the discussion in paragraphs [0036]- [0039]), wherein the hard magnetic member has a state in which the hard magnetic member is magnetized and a state in which the hard magnetic member is demagnetized, and the magnetizing unit is switchable between the state in which the hard magnetic member is magnetized and the state in which the hard magnetic member is demagnetized (see the discussion in paragraphs [0036]-[0038] where current of different values are applied to the coils to achieve different deformations of the mirror).

Regarding claim 53, Maruyama discloses the optical head according to claim 52, wherein: the deformable mirror is provided in a space below the objective lens actuator (see drawings 6-8).

Regarding claim 54, Maruyama discloses an optical recording and playback device that concentrates light on an optical recording and playback medium having two recording layers and performs at least one of recording information in and reading recorded information from the optical recording and playback medium, the optical recording and playback device comprising: an optical head (drawings 6 and 7); and a feeding portion that supplies the optical head with power (element 412 of drawing 18), the optical head configured to concentrate light on an optical recording and playback medium (see drawings 6 and 7 and the discussion in paragraphs [0002]-[0006]), the optical head including: an objective lens that concentrates light on the optical information recording medium (element 7 of drawings 6 and 7); an objective lens actuator that drives the objective lens (see the discussion in paragraphs [0002]-[0006]); and the deformable mirror disposed to reflect light emitted from a light source toward the objective lens (element 6 of drawings 6 and 7), a deformable mirror including: a reflection mirror having a reflection surface on which light is reflected (409a of drawings 16 and 18 and the discussion in paragraphs [0036]-[0039]), at least part of the reflection mirror being made of a ferromagnetic member (409e of drawings 16 and 18 and the discussion in paragraphs [0036]- [0039]), the reflection mirror having a deformed state and a non-deformed state (see the discussion in paragraphs [0017] and [0036]-[0038] where current of different values are applied to the coils to achieve different

Art Unit: 2627

deformations of the mirror); and a switching device that switches the reflection mirror between the deformed state and the non-deformed state using a magnetic force (elements 428 and 413 of drawings 16 and 18 respectively and the discussion in paragraphs [0036]-[0039]), the switching device having a hard magnetic member made of a hard magnetic material and a magnetizing unit (elements 426 and 427 of drawings 16 and 18 and the discussion in paragraphs [0036]- [0039]), wherein the hard magnetic member has a state in which the hard magnetic member is magnetized and a state in which the hard magnetic member is demagnetized, and the magnetizing unit is switchable between the state in which the hard magnetic member is magnetized and the state in which the hard magnetic member is demagnetized (see the discussion in paragraphs [0036]-[0038] where current of different values are applied to the coils to achieve different deformations of the mirror).

Regarding claim 55, Maruyama discloses the optical recording and playback device according to claim 54, wherein: the deformable mirror uses the reflection mirror as a plane mirror when light is concentrated on a first recording layer farther from a light-incident surface of the optical recording and playback medium, and deforms the reflection mirror to be a concave mirror with the reflection surface forming a concave surface when light is concentrated on a second recording layer closer to the light-incident surface of the optical information playback medium (see the discussion in paragraphs [0017] and [0036]- [0039]).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claims 38, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama (JP 2003-067969) in view of Nishioka et al. (US PGPub Number 2006/0187563 A1).**

Regarding claim 38, Maruyama discloses the deformable mirror according to claim 29 as noted in the 35 U.S.C. 102(b) rejection above. Maruyama, however fails to specifically disclose while Nishioka discloses wherein: the reflection mirror includes a base member comprising a glass plate (Figures 4 and 5 and the corresponding discussion in paragraphs [0180], [0193], [0194] and [0202]); and the ferromagnetic member is provided to at least part of the base member (see Figure 5 and the discussion in paragraphs [0192]-[0195]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Nishioka into that of Maruyama. One of ordinary skill in the art at the time the invention was made would have been motivated to combine the teachings in order to provide a support means for the mirror body as suggested by Nishioka in paragraph [0180].

Regarding claim 41, the combination of Maruyama and Nishioka disclose the deformable mirror according to claim 38. Nishioka further discloses wherein: the

Art Unit: 2627

reflection surface comprises a reflection coating provided on a surface of the base member (see the discussion in paragraph [0180]).

Regarding claim 42, the combination of Maruyama and Nishioka disclose the deformable mirror according to claim 41. Nishioka further discloses wherein: the reflection coating comprises a dielectric multi-layer film (see the discussion in paragraph [0180]).

Allowable Subject Matter

8. Claims 43, 44, 46-51 and 56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 43, 44, 46-51 and 56 are allowable for the reasons indicated in the previous Office Action.

Conclusion

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2627

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LaTanya Bibbins whose telephone number is (571)270-1125. The examiner can normally be reached on Monday through Friday 7:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571 272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LaTanya Bibbins/
Examiner, Art Unit 2627

/Wayne Young/
Supervisory Patent Examiner, Art Unit 2627